



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/602,307

06/24/2003

Kenneth M. Rose

CIS0199US

9007

33031 7590 07/09/2008
CAMPBELL STEPHENSON LLP
11401 CENTURY OAKS TERRACE
BLDG. H, SUITE 250
AUSTIN, TX 78758

EXAMINER

LEE, ANDREW CHUNG CHEUNG

ART UNIT

PAPER NUMBER

2619

MAIL DATE

DELIVERY MODE

07/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/602,307	Applicant(s) ROSE ET AL.	
	Examiner Andrew C. Lee	Art Unit 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-20, 23 and 29-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-20, 23 and 30-32, 35, 37, 39 is/are rejected.
- 7) ☒ Claim(s) 33, 34, 36 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Claims 1 – 6, 9 – 20, 23, 29 - 39 are pending.
Claims 7, 8, 21, 22, 24, 25, 26, 27, 28 had been canceled.
Claims 34 – 39 are newly added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulwels (US 20010030974 A1) in view of Ofek (US 6760328 B1).

Regarding claim 1, Pauwels teaches a method comprising: transmitting a first data stream to a switch fabric, said first data stream having a first priority ("traffic from lower priority classified queues" correlates to transmitting a first data stream to a switch fabric, said first data stream having a first priority; Page 1, paragraph [0013]); and at any time during said transmission, interrupting said transmission of said first data stream ("traffic has arrived at a queue having a higher priority classification than the queue from which traffic is currently being transmitted, suspend the current transmission" correlates to interrupting said transmission of said first data stream) to transmit a second data stream to said switch fabric, said second data stream having a second priority ("traffic

has arrived at a queue having a higher priority classification” correlates to second data stream having a second priority; Page 1, paragraph [0013]);

Pauwels does not disclose explicitly interrupting said transmission of said second data stream to resume transmission of said first data stream to the switching fabric.

Ofek teaches interrupting said transmission of said second data stream to resume transmission of said first data stream to the switching fabric (“providing a completion signal Responsive to the completion signal, for resuming the active transmission of the low first priority data packet”; col. 27, lines 15 – 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Pauwels to include the features of interrupting said transmission of said second data stream to resume transmission of said first data stream to the switching fabric as taught by Ofek in order to provide virtual pipes that carry real-time traffic over packet switching networks with widely varying link speeds, while guaranteeing end-to-end performance (as suggested by Ofek, see col. 3 lines 9 – 11).

Regarding claim 2, Pauwels teaches the method of claimed further comprising: resuming transmission of said first data stream even through there is data of the second data stream to transmit to the switching fabric (“once the interrupting transmission has completed, the transmission of the unfinished cell or packet can be immediately resumed from the point at which it was interrupted” correlates to resuming transmission of said first data stream even through there is data of the second data stream to transmit to the switching fabric; page 2, paragraph [0014], page 3, paragraphs [0050],

[0051]) .

Regarding claim 3, Pauwels teaches the method claimed further comprising stopping said transmission of said first data stream; transmitting a first switch code; and transmitting said second data stream (page 3, paragraph [0050], page 4, paragraph [0054]).

Regarding claim 4, Pauwels teaches the method claimed further comprising: transmitting a second switch code; and resuming transmission of said first data stream (page 3, paragraph [0051], page 4, paragraph [0054]).

Regarding claim 5, Pauwels teaches the method claimed wherein said first priority is a low priority (“traffic from lower priority classified queues” correlates to said first priority is a low priority); and said second priority is a high priority (traffic has arrived at a queue having a higher priority classification”; page 1, paragraph [0013]).

Regarding claim 6, Pauwels teaches the method claimed further comprising: stopping transmission of a frame of said first data stream after detection of a start of frame and prior to detection of an end of frame (page 3, paragraph [0053]).

4. Claims 1 – 6, 9 – 20, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis et al. (5497371) in view of Ofek (US 6760328 B1).

Regarding claims 1, 13, 23, Ellis et al. teach a method, an apparatus comprising: a first buffer (Fig. 2, element 28, low priority Buffer correlates to a first buffer) configured to store data of a first data stream prior to transmission to a switching fabric, said data of said first data stream having a first priority (“to store the packeted data to be

Art Unit: 2619

transmitted, and low priority” correlates to configured to store data of a first data stream prior to transmission to a switching fabric, and a first priority; Fig. 2, col. 4, lines 36 – 52); a second buffer (Fig 2, element 26, high priority buffer correlates to a second buffer) configured to store data of a second data stream prior to transmission to a switching fabric, said data of said second data stream having a second priority (“high priority” correlates to a second priority; Fig. 2, col. 4, lines 36 – 52); a priority switch circuit (Fig. 2, element 30 priority encoder correlates to a priority switch circuit) coupled to said first buffer and said second buffer, wherein said priority switch circuit is configured to upon detection of data of said second data stream, interrupt a transmission of data of said first data stream from the first buffer at any time during said transmission and transmit data of said second data stream from the second buffer (Fig 2, col. 4, lines 40 – 66).

Ellis et al. do not disclose explicitly wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer.

Ofek teaches wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer (“providing a completion signal Responsive to the completion signal, for resuming the active transmission of the low first priority data packet”; col. 27, lines 15 – 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. to include the features of

Art Unit: 2619

wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer as taught by Ofek in order to provide virtual pipes that carry real-time traffic over packet switching networks with widely varying link speeds, while guaranteeing end-to-end performance (as suggested by Ofek, see col. 3 lines 9 – 11).

Regarding claim 2, Ellis et al. teach the limitation of the method of claimed further comprising: resuming transmission of said first data stream even through there is data of the second data stream to transmit to the switching fabric (“it is possible for a low priority packet to be interrupted as often as required and to be fragmented to any size, depending on the arrival of high priority packets at the transmit queue” correlates to resuming transmission of said first data stream even through there is data of the second data stream to transmit to the switching fabric; col. 4, lines 61 – 65).

Regarding claim 3, Ellis et al. teach the limitation of the method, apparatus of claimed further comprising stopping said transmission of said first data stream; transmitting a first switch code; and transmitting said second data stream (Fig. 3, col. 5, lines 10 – 20).

Regarding claim 4, Ellis et al. teach the limitation of the method of claimed further comprising: transmitting a second switch code; and resuming transmission of said first data stream (Fig. 3, col. 4, lines 44 – 48, lines 61 – 63)

Regarding claim 5, Ellis et al. teach the limitation of the method of claimed wherein said first priority is a low priority ("low priority" correlates to said first priority is a low priority); and said second priority is a high priority ("high priority" correlates to said second priority is a high priority; col. 4, lines 38 – 44).

Regarding claim 6, Ellis et al. teach the limitation of the method, apparatus of claimed further comprising: stopping transmission of a frame of said first data stream after detection of a start of frame and prior to detection of an end of frame (col. 4, lines 41 – 48).

Regarding claim 9, Ellis et al. teach the method claimed further comprising: storing data of said first data stream in a first FIFO (Fig. 2, element 28 low priority buffer and queue; col. 4, lines 38 – 44); and storing data of said second data stream in a second FIFO (Fig. 2, element 26 high priority buffer and queue; col. 4, lines 38 – 44).

Regarding claim 10, Ellis et al. teach the method claimed wherein said interrupting of transmission of the first data stream comprises: upon detection of data in said second FIFO, interrupting said first data stream (col. 4, lines 41 – 44).

Regarding claim 11, Ellis et al. teach the method claimed further comprising: receiving a data stream at a line card (col. 3, lines 51 – 54), said data stream comprising frames of said first data stream and frames of said second data stream; and detecting the priority of said frames of said data stream (col. 3, lines 54 – 63).

Regarding claims 12, Ellis et al. do not teach the method claimed wherein transmission of the second data stream is interrupted to transmission a predetermined amount of bytes of data of said first data stream.

Ofek teaches wherein transmission of the second data stream is interrupted to transmission a predetermined amount of bytes of data of said first data stream (col. 16, lines 61 – 67, col. 17, lines 30 – 37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. to include the features of wherein transmission of the second data stream is interrupted to transmission a predetermined amount of bytes of data of said first data_stream as taught by Ofek in order to provide virtual pipes that carry real-time traffic over packet switching networks with widely varying link speeds, while guaranteeing end-to-end performance (as suggested by Ofek, see col. 3 lines 9 – 11).

Regarding claims 14, Ellis et al. teach the apparatus claimed wherein said priority switch circuit (Fig. 2, element 30 priority encoder correlates to a priority switch circuit) is further configured to resume transmission of said first data stream if there is no data of said second data stream to transmit (col. 4, lines 40 – 52, lines 61 – 63).

Regarding claim 15, Ellis et al. teach the apparatus claimed wherein said priority switch circuit (Fig. 2, element 30 priority encoder correlates to a priority switch circuit) is further configured to transmit a first switch code after the second buffer has transmitted data of said second data stream and prior to resuming the transmission of data of said first data stream (Fig. 2, element 30 priority encoder correlates to a priority switch circuit, col. 4, lines 44 – 52).

Regarding claim 16, Ellis et al. teach the apparatus claimed wherein said priority switch circuit (Fig. 2, element 30 priority encoder correlates to a priority switch circuit) is

configured to transmit a second switch code upon detection of data of said second data stream in the second buffer (Fig. 2, element 30 priority encoder correlates to a priority switch circuit, col. 4, lines 44 – 52).

Regarding claim 17, Ellis et al. teach the apparatus claimed wherein said priority switch circuit is further configured to interrupt transmission of said first data stream during transmission of a packet of said first data stream from said first buffer (Fig. 3, col. 5, lines 10 – 20).

Regarding claim 18, Ellis et al. teach the apparatus claimed wherein said priority switch circuit is further configured to transmit a predetermined amount of bytes from said first buffer when the priority switch circuit resumes transmission of the first data stream (col. 4, lines 63 – 66).

Regarding claim 19, Ellis et al. fail to teach the apparatus claimed further comprising: a port coupleable to a network device; and a forwarding engine coupled between said port and each of said first and second buffers, said forwarding engine configured to forward frames of said first data stream to said first buffer and forward second frames of said second data stream to said second buffer.

Ofek teaches the apparatus of claimed further comprising: a port coupleable to a network device (SVP switch interpreted as a network device and input and output ports; Fig. 1, col. 9, lines 54 – 58) and a forwarding engine coupled between said port and each of said first and second buffers, said forwarding engine configured to forward frames of said first data stream to said first buffer and forward second frames of said

Art Unit: 2619

second data stream to said second buffer (Fig. 7, Fig. 10, col. 12, lines 49 – 56, col. 16, lines 57 – 67) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. to include the features of a port coupleable to a network device; and a forwarding engine coupled between said port and each of said first and second buffers, said forwarding engine configured to forward frames of said first data stream to said first buffer and forward second frames of said second data stream to said second buffer as taught by Ofek in order to provide virtual pipes that carry real-time traffic over packet switching networks with widely varying link speeds, while guaranteeing end-to-end performance (as suggested by Ofek, see col. 3 lines 9 – 11).

Regarding claim 20, Ellis et al. teach the limitation of the apparatus of claimed further comprising: a serial link (Fig. 2) configured to serialize data received from said first and said second buffers and said priority switch circuit and transmit said serialized data to a switching fabric (“serially transmitting in packets of various sizes digital data of two or more priorities over a link” interpreted as a serial link configured to serialize data received from said first and said second buffers; col. 3, lines 51 – 54).

5. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis et al. (5497371) and Ofek (US 6760328 B1) as applied to claims 1, 9 above, and further in view of Luke et al. (US 6745264 B1, prior art).

Regarding claim 32, Ellis et al. and Ofek do not disclose the method claimed wherein the first and second FIFOs are implemented as circular FIFOs, the first and second FIFOs are implemented in a single memory, and a boundary between the first and second FIFOs is set by a pointer.

Luke et al. teach the method claimed wherein the first and second FIFOs are implemented as circular FIFOs (Fig. 1, Fig 2, col. 1, lines 49 – 57), the first and second FIFOs are implemented in a single memory (Fig. 5, element 16, col. 4, lines 43 – 50), and a boundary between the first and second FIFOs is set by a pointer (“pointers”; Fig. 7, col. 5, lines 29 – 40, Fig. 5, col. 4, lines 43 – 57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. and Ofek to include the features of claimed wherein the first and second FIFOs are implemented as circular FIFOs, the first and second FIFOs are implemented in a single memory, and a boundary between the first and second FIFOs is set by a pointer as taught by Luke et al. in order to provide a control circuit dividing a single memory into buffer partitions for each physical endpoint and identifies each endpoint as either isochronous or non-isochronous (as suggested by Luke et al., see col. 2, lines 41 – 44).

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis et al. (5497371) in view of Lund et al. (5517495).

Regarding claim 30, Ellis et al. disclose an apparatus comprising: a first buffer (Fig. 2, element 28, low priority Buffer correlates to a first buffer) configured to store data of a first data stream prior to transmission to a switching fabric, said data of said

first data stream having a first priority (“to store the packeted data to be transmitted, and low priority” correlates to configured to store data of a first data stream prior to transmission to a switching fabric, and a first priority; Fig. 2, col. 4, lines 36 – 52); a second buffer (Fig 2, element 26, high priority buffer correlates to a second buffer) configured to store data of a second data stream prior to transmission to said switching fabric, said data of said second data stream having a second priority (“high priority” correlates to a second priority; Fig. 2, col. 4, lines 36 – 52; and a priority switch circuit coupled to said first buffer and said second buffer (Fig. 2, element 30 priority encoder correlates to a priority switch circuit), wherein said priority switch circuit is configured to, upon detection of data of said second data stream, interrupt a transmission of data of said first data stream from the first buffer at any time during said transmission and transmit data of said second data stream from the second buffer (Fig 2, col. 4, lines 40 – 66, col. 5, lines 10 – 20).

Ellis et al. do not disclose explicitly wherein said switching fabric is comprised of a first crossbar, wherein said first crossbar is configured to receive said first data stream, wherein said switching fabric is comprised of a second crossbar, wherein said second crossbar is configured to receive said second data stream.

Lund et al. teach wherein said switching fabric is comprised of a first crossbar, wherein said first crossbar is configured to receive said first data stream, wherein said switching fabric is comprised of a second crossbar, wherein said second crossbar is configured to receive said second data stream (“element 12” interpreted as first data

stream, "element 14" interpreted as second data stream, "element 32 crossbar"; Fig. 1, col. 2, lines 64 – 67, col. 3, lines 1 – 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. to include the features of wherein said switching fabric is comprised of a first crossbar, wherein said first crossbar is configured to receive said first data stream, wherein said switching fabric is comprised of a second crossbar, wherein said second crossbar is configured to receive said second data stream as taught by Lund et al. in order to provide a FARR method performs input-buffered switch scheduling with improved performance over other input-buffered switch scheduling emthods such as SLIP, PIM, etc. (as suggested by Lund et al., see col. 2, lines 36 – 39).

7. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis et al. (5497371), and Lund et al. (5517495) and in view of Ofek (US 6760328 B1).

Regarding claim 31, Ellis et al. and Lund et al. do not disclose the method claimed wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer.

Ofek teaches the method claimed wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer ("providing a

Art Unit: 2619

completion signal Responsive to the completion signal, for resuming the active transmission of the low first priority data packet”; col. 27, lines 15 – 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ellis et al. to include the features of the method claimed wherein said priority switch circuit is further configured to interrupt said transmission of said second data stream from the second buffer to resume transmission of said first data stream from the first buffer as taught by Ofek in order to provide virtual pipes that carry real-time traffic over packet switching networks with widely varying link speeds, while guaranteeing end-to-end performance (as suggested by Ofek, see col. 3 lines 9 – 11).

Allowable Subject Matter

8. Claim 29 is allowed.

The following is an examiner’s statement of reasons for allowance:

The prior art made of record, in single or in combination, fails to disclose explicitly the limitations of:

“the first switch code comprises at least one of an indication that the data following the first switch code has a different priority than the data preceding the first switch code and that the data preceding the first switch code is the last data of a frame, and the second switch code comprises at least one of an indication that the data following the second switch code has a different priority than the data preceding the second switch code and that the data preceding the second switch code is the last data of a frame” as disclosed in claim 29.

Art Unit: 2619

9. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

10. Claims 33, 34, 36, 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments filed on 4/14/2008 with respect to claims 1 – 6, 9 – 20, 23, 29 - 39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kadambi et al. (6952401 B1).
- Barroso et al. (6636949 B2).
- Youngblood (4980820).
- Bruckman (6891855).
- Fichou et al. (5790522).

Art Unit: 2619

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew C Lee/
Examiner, Art Unit 2619
<7/01/2008>

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2619